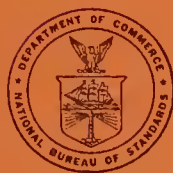


Bibliography on Ignition and Spark-Ignition Systems



U.S. Department of Commerce

National Bureau of Standards

Miscellaneous Publication 251

THE NATIONAL BUREAU OF STANDARDS

Functions and Activities

The functions of the National Bureau of Standards include the development and maintenance of the national standards of measurement and the provision of means and methods for making measurements consistent with these standards; the determination of physical constants and properties of materials; the development of methods and instruments for testing materials, devices, and structures; advisory services to government agencies on scientific and technical problems; invention and development of devices to serve special needs of the Government; and the development of standard practices, codes, and specifications, including assistance to industry, business and consumers in the development and acceptance of commercial standards and simplified trade practice recommendations. The work includes basic and applied research, development, engineering, instrumentation, testing, evaluation, calibration services, and various consultation and information services. Research projects are also performed for other government agencies when the work relates to and supplements the basic program of the Bureau or when the Bureau's unique competence is required. The scope of activities is suggested by the listing of divisions and sections on page 26.

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Bibliography on Ignition and Spark-Ignition Systems

G. F. Blackburn



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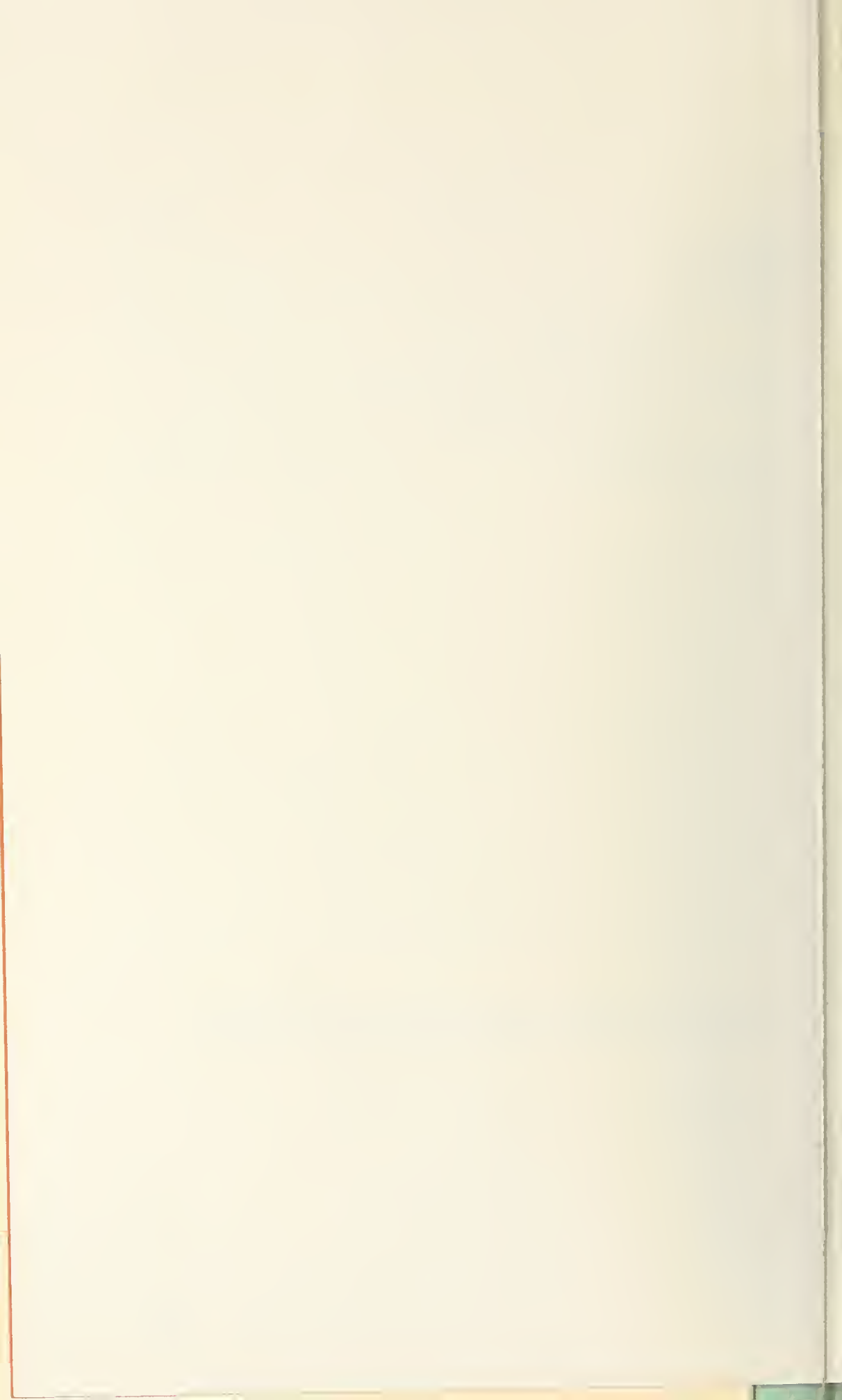
(Supersedes NBS Circular 580)



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Bibliography on Ignition and Spark-Ignition Systems

G. F. Blackburn

Approximately 730 references to books, papers, and reports are listed on ignition of combustible gaseous mixtures and ignition apparatus. The ignition of gases includes ignition by electric sparks and arcs and by hot surfaces. The references on ignition apparatus are for the most part on ignition systems and components for internal-combustion engines, with spark plugs listed separately from other components.

1. Introduction

This publication supersedes National Bureau of Standards Circular 580. It covers the initiation of combustion in explosive gaseous mixtures by means other than compression ignition, as well as electric equipment for spark-ignition engines.

Part 2.1 lists books in which ignition or ignition equipment is either the main topic or is given fairly extensive treatment.

The references to other publications are presented under three main heads. The first concerns ignition of combustible mixtures of gases and vapors, and is subdivided into two parts, according to whether ignition is effected by an electric spark or arc or by a heated surface. Part 2.2.a includes references to work on measuring spark energy. Part 2.2.b covers both fundamental investigations of ignition by heated surfaces and ignition by hot spots in internal-combustion engines.

Although ignition is an essential stage in the combustion process, papers dealing primarily with the kinetics of combustion, flame propagation, and detonation, or with the flammability limits of composition, temperature, and pressure of gases, have not been included in this bibliography unless they were found to contribute also to an understanding of ignition phenomena.

Part 2.3 lists references on spark-ignition systems for internal-combustion engines, and their components. It includes work on testing and test equipment. Because there are so many references to spark plugs, these are listed separately as part 2.3.b.

Part 2.4 contains miscellaneous references on ignition that do not fall within the category of part 2.2. Included are a number of papers and reports concerning explosion hazards and ignition of fuels used in rocket propulsion.

Within each topical subdivision the references are given in chronological order, and within each chronological subdivision, alphabetically by author, followed by anonymous references.

The journal abbreviations used are those employed in Chemical Abstracts, except that the abbreviation NACA is used for the National Advisory Committee for Aeronautics and SAE J. for the Journal of the Society of Automotive Engineers. An unpublished paper presented before a technical or professional society is designated by the abbreviation M. P. for Meeting Paper. Volume numbers are in boldface, and the date of issue is given in cases where page numbers do not run consecutively through a given volume.

In general, the reports and papers listed are available only in libraries, and none can be supplied by the Bureau. The Federal Specification for Spark Plugs, W-S-506(2) (listed in part 2.3.b), may be obtained for 10 cents from the Business Service Center, Federal Supply Service, General Services Administration Regional Office, Washington D.C. 20407. The sources of translation of several articles in foreign languages are given. Some of these are available from the Office of Technical Services (OTS), U.S. Department of Commerce, Washington D.C. 20230. That agency can usually furnish information as to the availability of translations of other foreign-language articles. Information as to the availability of other reports should be obtained from the author or from the sponsoring organization.

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THE NATIONAL BUREAU OF STANDARDS

The scope of activities of the National Bureau of Standards at its major laboratories in Washington, D.C., and Boulder, Colorado, is suggested in the following listing of the divisions and sections engaged in technical work. In general, each section carries out specialized research, development, and engineering in the field indicated by its title. A brief description of the activities, and of the resultant publications, appears on the inside of the front cover.

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Electricity. Resistance and Reactance. Electrochemistry. Electrical Instruments. Magnetic Measurements. Dielectrics. High Voltage. Absolute Electrical Measurements.

Metrology. Photometry and Colorimetry. Refractometry. Photographic Research. Length. Engineering Metrology. Mass and Volume.

Heat. Temperature Physics. Heat Measurements. Cryogenic Physics. Equation of State. Statistical Physics.

Radiation Physics. X-ray. Radioactivity. Radiation Theory. High Energy Radiation. Radiological Equipment. Nucleonic Instrumentation. Neutron Physics.

Analytical and Inorganic Chemistry. Pure Substances. Spectrochemistry. Solution Chemistry. Standard Reference Materials. Applied Analytical Research. Crystal Chemistry.

Mechanics. Sound. Pressure and Vacuum. Fluid Mechanics. Engineering Mechanics. Rheology. Combustion Controls.

Polymers. Macromolecules: Synthesis and Structure. Polymer Chemistry. Polymer Physics. Polymer Characterization. Polymer Evaluation and Testing. Applied Polymer Standards and Research. Dental Research.

Metallurgy. Engineering Metallurgy. Metal Reactions. Metal Physics. Electrolysis and Metal Deposition.

Inorganic Solids. Engineering Ceramics. Glass. Solid State Chemistry. Crystal Growth. Physical Properties. Crystallography.

Building Research. Structural Engineering. Fire Research. Mechanical Systems. Organic Building Materials. Codes and Safety Standards. Heat Transfer. Inorganic Building Materials. Metallic Building Materials.

Applied Mathematics. Numerical Analysis. Computation. Statistical Engineering. Mathematical Physics. Operations Research.

Data Processing Systems. Components and Techniques. Computer Technology. Measurements Automation. Engineering Applications. Systems Analysis.

Atomic Physics. Spectroscopy. Infrared Spectroscopy. Far Ultraviolet Physics. Solid State Physics. Electron Physics. Atomic Physics. Plasma Spectroscopy.

Instrumentation. Engineering Electronics. Electron Devices. Electronic Instrumentation. Mechanical Instruments. Basic Instrumentation.

Physical Chemistry. Thermochemistry. Surface Chemistry. Organic Chemistry. Molecular Spectroscopy. Elementary Processes. Mass Spectrometry. Photochemistry and Radiation Chemistry.

Office of Weights and Measures.

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Cryogenic Processes. Cryogenic Properties of Solids. Cryogenic Technical Services. Properties of Cryogenic Fluids.

CENTRAL RADIO PROPAGATION LABORATORY

Ionosphere Research and Propagation. Low Frequency and Very Low Frequency Research. Ionosphere Research. Prediction. Services. Sun-Earth Relationships. Field Engineering. Radio Warning Services. Vertical Soundings Research.

Troposphere and Space Telecommunications. Data Reduction Instrumentation. Radio Noise. Tropospheric Measurements. Tropospheric Analysis. Spectrum Utilization Research. Radio-Meteorology. Lower Atmosphere Physics. Radio Systems. Applied Electromagnetic Theory. High Frequency and Very High Frequency Research. Frequency Utilization. Modulation Research. Antenna Research. Radiodetermination.

Upper Atmosphere and Space Physics. Upper Atmosphere and Plasma Physics. High Latitude Ionosphere Physics. Ionosphere and Exosphere Scatter. Airglow and Aurora. Ionospheric Radio Astronomy.

RADIO STANDARDS LABORATORY

Radio Standards Physics. Frequency and Time Disseminations. Radio and Microwave Materials. Atomic Frequency and Time-Interval Standards. Radio Plasma. Microwave Physics.

Radio Standards Engineering. High Frequency Electrical Standards. High Frequency Calibration Services. High Frequency Impedance Standards. Microwave Calibration Services. Microwave Circuit Standards. Low Frequency Calibration Services.

Joint Institute for Laboratory Astrophysics-NBS Group (Univ. of Colo.).

